

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of inserting a plurality of entries into an existing index keyed by multidimensional data, comprising:

selecting nodes of the index each having entries, wherein the selection is based on that the nodes of the index would ~~and that~~ overlap if when the plurality of entries are inserted into a first one of the nodes of the index, and wherein the selected nodes of the index are sibling nodes;

inserting the entries within the first one of the nodes of the index;

partitioning the entries of the first one of the nodes into groups to reduce overlap, wherein each group of entries corresponds to a partitioned node of the index; and

reorganizing the a second one of the nodes of the index and the partitioned nodes, wherein said reorganizing includes reorganizing the entries in each of the second one of the nodes and the partitioned nodes such that an amount of overlap is reduced.

2. (cancelled)

3. (previously presented) The method according to claim 1, wherein:

the entries include spatial data; and

the index keyed by multidimensional data includes a spatial index.

4. (previously presented) The method according to claim 1, wherein the sibling nodes are for an R-Tree index.

5. (cancelled)

6. (currently amended) A method of inserting a plurality of entries into a an existing spatial index, comprising:

selecting at least two and less than all children of a node in the spatial index, ~~selected children include distributed within~~ each of the selected children having entries, wherein the selection is based on that the selected children of the index would overlap when the plurality of entries are distributed within a first one of the selected children of the index, and wherein the selected children of the index are sibling;

distributing the entries within a first one of the selected children;

partitioning the entries of the first one of the selected children into groups to reduce

overlap, wherein each group of entries corresponds to a partitioned child of the index;

and

reorganizing the partitioned children and a second one of the selected children, wherein the

reorganizing includes reorganizing the distribution of the entries in each of the second

one of the selected children and the partitioned children.

7. (previously presented) The method according to claim 6, wherein said reorganizing includes reorganizing such that an amount of overlap of bounding boxes for objects in the spatial index is reduced.

8. (previously presented) The method according to claim 7, wherein one of the bounding boxes includes a minimum bounding rectangle (MBR).

9. (previously presented) The method according to claim 6, wherein at least two of the selected children have respective bounding boxes that overlap with one another.

10. (previously presented) The method according to claim 6, wherein said selecting includes selecting exactly two of the children.

11. (previously presented) The method according to claim 10, wherein the exactly two of the children have respective bounding boxes that overlap with one another.

12. (cancelled).

13. (cancelled)

14. (currently amended) A method of inserting a plurality of entries into an existing multidimensional-keyed index organized as an R-Tree, comprising:

associating a node in the R-tree with a buddy node that is a sibling of the node;

clustering selected children of the node and the children of the buddy node, each of the selected children having entries, wherein the selection of the children is based on that the selected children would overlap when the plurality of entries are distributed within a first one of the selected children;

partitioning ~~the clustered children and~~ the entries of the clustered children of the node and the buddy node into a plurality of groups, wherein at least one of the groups includes a child node of the clustered children of the node and the buddy node ~~cluster node~~, a buddy child node associated the child node, and one or more of the entries, said partition is performed so that overlap among bounding boxes associated with the groups is reduced;

inserting said one or more of the entries among the child node and the buddy child node associated the child node; and

reorganizing the child node and the buddy child node associated the child node, wherein the reorganizing includes reorganizing the distribution of the entries in each of the child node and the buddy child node associated the child node.

15. (previously presented) The according to claim 14, wherein:

each node of the R-tree is associated with a respective bounding box; and
a first bounding box associated with the child node overlaps a second bounding box associated with the buddy child node.

16. (cancelled)

17. (cancelled)

18. (currently amended) A tangible computer-readable medium bearing instructions for inserting a plurality of entries into an existing index keyed by multidimensional data, said instructions arranged, upon execution by at least one processor, to perform the steps of:

selecting nodes of the index each having entries, wherein the selection is based on that the nodes of the index would ~~and that~~ overlap if when the plurality of entries are inserted into a first one of the nodes of the index, and wherein the selected nodes of the index are sibling nodes;

inserting the entries within the first one of the nodes of the index;

partitioning the entries of the first one of the node into groups to reduce overlap, wherein each group of entries corresponds to a partitioned node of the index; and

reorganizing the a second one of the nodes of the index and the partitioned nodes, wherein said reorganizing includes reorganizing the entries in each of the second one of the nodes and the partitioned nodes such that an amount of overlap is reduced.

19. (currently amended) A tangible computer-readable medium bearing instructions for inserting a plurality of entries into an existing spatial index, said instructions arranged, upon execution by at least one processor, to perform the steps of:

selecting at least two and less than all children of a node in the spatial index each of the selected children having entries, wherein the selection is based on that the selected children of the index would overlap when the plurality of entries are distributed within

a first one of the selected children of the index, and wherein the selected children of the index are sibling;

distributing the entries within a first one of the selected children;

partitioning the entries of the first one of the selected children into groups to reduce

overlap, wherein each group of entries corresponds to a partitioned child of the index;

and

reorganizing the partitioned children and a second one of the selected children, wherein the

reorganizing includes reorganizing the distribution of the entries in each of the second

one of the selected children and the partitioned children such that an amount of overlap

of bounding boxes is reduced.

20. (currently amended) A tangible computer-readable medium bearing instructions for inserting a plurality of entries into existing multidimensional-keyed index organized as an R-Tree, said instructions arranged, upon execution by at least one processor, to perform the steps of:

associating a node in the R-tree with a buddy node that is a sibling of the node;

clustering selected children of the node and the children of the buddy node, each of the

selected children having entries, wherein the selection of the children is based on that

the selected children would overlap when the plurality of entries are distributed within

a first one of the selected children;

partitioning ~~the clustered children and~~ the entries of the clustered children of the node and

the buddy node into a plurality of groups, wherein at least one of the groups includes a

child node of the clustered children of the node and the buddy node ~~cluster node~~, a

buddy child node associated the child node, and one or more of the entries, said partition is performed so that overlap among bounding boxes associated with the groups is reduced;

inserting said one or more of the entries among the child node and the buddy child node associated the child node; and

reorganizing the child node and the buddy child node associated the child node, wherein the reorganizing includes reorganizing the distribution of the entries in each of the child node and the buddy child node associated the child node.